

REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 1, 3-6, 10-14 and 17-32 will be pending in the application subsequent to entry of this Amendment.

Amendments to the Claims

Claim 1 has been amended to specify that the milling fluid is both solvent and water miscible. Basis for this amendment can be found at page 4, lines 1 to 2. Claim 1 has also been amended to delete glycols from the list of milling fluids. Finally, two typographical errors have been corrected in claim 1: ("fluids" to "fluid" and "either" to "ether").

Claim 13 has been amended for consistency with claim 1 by deleting the glycols from the list of preferred milling fluids (page 6, lines 5 to 9 of the description sets out which of the preferred milling fluids are glycols).

Response to Prior Art-Based Rejections

Previous claims 1, 4 to 6, 12 to 13, 17 to 20 and 22 to 31 were rejected under 35 USC 103(a) as being unpatentable over US patent number 4,725,317 to Wheeler, in view of newly cited US patent number 4,820,552 to Espinosa-C et al.

Wheeler describes a standard method of ball milling metal powder in an organic liquid, such as mineral spirits. The main focus of Wheeler is however the formation of a paste of the thus-formed metal flake pigment with an organic binder. The Examiner argues that it would have been obvious to replace the mineral spirits in the initial milling step of Wheeler with, for example, glycols, on the basis of the teaching of Espinosa-C. However, Applicant respectfully submits that the subject matter of claim 1 as presently amended is not obvious from the teaching of the prior art.

Claim 1 has been amended to require that the milling fluid as a whole must be both solvent and water miscible. This feature is neither taught nor suggested by the prior art.

Wheeler exemplifies mineral spirits as a milling fluid.

The only example of Espinosa-C uses a mixture of benzene trichloride and diethylene glycol. The examiner must also take into account the solubility of these two solvents. From Wikipedia: "Diethylene glycol (DEG) is an organic compound described by the structural

formula HO-CH₂-CH₂-O-CH₂-CH₂-OH. It is a clear, hydroscopic, odorless liquid. It is 100% soluble in water and miscible with polar organic solvents such as alcohols and ethers."

Solubility in hydrocarbons is virtually zero; e.g. heptane 0.03% (see

http://www.meglobal.biz/literature/product_guides/MEGlobal_DEG.pdf.

For benzene trichloride, alias trichlorobenzene, solubility of the various isomers is limited to ether, or ether and benzene. It is water insoluble. (Ref. Handbook of Physics & Chemistry, 69th Edn., 1988-89, page C-118, ISBN 0-8493-0469-5.)

There is no suggestion in Wheeler or Espinosa-C that these milling fluids are both solvent and water miscible, and indeed one skilled in the art would recognize that they are not.

The prior art is merely concerned with conventional milling processes. Thus, as described above, Wheeler refers to a known milling step that can be integrated with further steps of the invention described therein (column 2, lines 19 to 20). Espinosa-C refers to milling vehicles that are conventionally employed (column 2, lines 21 to 24), and goes on to describe that desirable liquid vehicles are those which have lower vapor pressure, higher flashpoint, higher distillation range, are non-toxic and have lesser explosion hazards in the grinding operation (column 2, lines 29 to 31). Thus there is no suggestion in either Wheeler or Espinosa-C that the milling fluid should be one that is both solvent and water miscible.

The basis of the present invention is that the inventors realized that the need for a more convenient product could be met by grinding metal powders in a milling fluid that is both solvent and water miscible. As described at page 3, lines 29 to 31 of the present application, an advantage of using such a milling fluid is that one product can be employed in both solvent-based and water-based coatings, resulting in reduced stockholding for the customer. This would not have been obvious from the prior art, because neither Wheeler nor Espinosa-C contemplates the same problem. Wheeler is concerned with addition of an organic binder to the product of the milling process, and Espinosa-C is concerned with a further step of coating the metal particles with metal oxides. Neither of these prior art processes requires that the milling fluid be both solvent and water miscible.

The completion of the present invention does not simply involve a substitution of one type of milling fluid for another, functionally equivalent, substance, because the present invention requires selection of specific substances to ensure that the milling fluid is both solvent and water miscible. Espinosa-C does not suggest selection of a solvent and water miscible milling fluid, because in the only Example the milling fluid as a whole is not water-soluble. The Examiner will note also that glycols have been deleted from the milling fluids recited in claim 1, and therefore the subject matter of the claims is distinguished further from Espinosa-C.

With regard to claim 22, the Applicant respectfully submits that, as would be recognized by one skilled in the art, mineral spirits are not a type of mineral oil. Please see attached extract from The Condensed Chemical Dictionary, 10th Edn, revised by Gessner G. Hawley, 1981, Van Nostrand Reinhold Co. Inc., ISBN 0-442-23244-6, which provides separate definitions for mineral oil and mineral spirits. Both are types of hydrocarbons, with mineral oil being of significantly higher molecular weight than mineral spirits. Thus mineral oil has lubricating properties (and so is suitable for use as a lubricant according to claim 22), while mineral spirits do not. Indeed, if mineral spirits was a lubricant, there would be no need to add one to traditional formulations.

In addition to the rejection discussed above, the Office Action contains a rejection of claim 14 over the combination of Wheeler in view of Espinosa-C and Romano, Jr et al, or Wheeler in view of Espinosa-C and Okutsu et al. Furthermore, claims 3, 10 to 11 and 21 are rejected over the combination of Wheeler in view of Espinosa-C and Kramer et al. These dependent claims are not obvious in view of the combination of Wheeler and Espinosa-C for the same reasons as discussed above for claim 1 and because the limitations of an independent claim are incorporated in their dependent claims. MPEP §2143.03 citing *In re Fine*, 5 USPQ2d 1596 (Fed. Cir. 1988). Furthermore, the combination with Romano, Okutsu or Kramer is not proper, because none of these documents are concerned with grinding of metal pigments. They are therefore not concerned with the same technical considerations as the present invention.

WHEELER
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Thus Applicant respectfully submits that, for at least the reasons above, the subject matter of the present claims would not have been obvious from any of the cited prior art, alone or in combination.

For the above reasons it is respectfully submitted that the claims define inventive subject matter. The examiner is invited to contact the undersigned if any further information is required.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: //Arthur R. Crawford//
Arthur R. Crawford
Reg. No. 25,327

ARC:eaw
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

these particles, and to some extent by the fat particles, rather than to the presence of a pigment. The casein content congogetes (a) when high temperature or bacteria convert the lactose to lactic acid, as in souring, or (b) when certain enzymes (fennet) are intentionally added. The serum proteins (beta-lumulin and lecoglabinin) are also colloidally dispersed. The lactose and mineral salts are in true molecular solution. Thus milk is a complex system exhibiting several levels of dispersion, from macromolecular through colloidal and into the microscopic range. Important processes applied to milk on an industrial scale include pasteurization, homogenization, coagulation, dehydration, and condensation (see, specific entries). The milks of animals other than cows show considerable variations in composition, especially fat and protein content. See also colloid chemistry; emulsion; casein.

milk of lime (lime water). Calcium hydroxide suspended in water.

milk of magnesia (magnesia, magnesia). A white, opaque, more or less viscous suspension of magnesium hydroxide in water from which varying proportions of water usually separate on standing. Grade: U.S. P. Use: Medicine (laxative).

milk sugar. See lactose.

milli- Prefix meaning 10^{-3} unit, or 1/1,000th part.

milliliter. See cubic centimeters (cc).

milligram (mg). One-thousandth gram (10^{-3} gram).

milliequivalent (meq). One-thousandth of the equivalent weight of a substance.

milliliter (ml). One thousandth liter; the volume occupied by one gram of pure water at 4°C and 760 mm pressure. One milliliter (ml) equals 1.000/0.027 cubic centimeters (cc).

millimeter (mm). One-thousandth meter, about 0.03937 inch.

millimole (mmol). One-thousandth molar, 10 angstrom unit, 1 billionth meter, 1 nanometer.

milliken. One thousandth mm. See rem.

"Milorganite" Trademark for an activated sludge marketed in dry granular form by the Milwaukee sewage disposal plant. Contains 5-10% moisture, 6.5-7.5% ammonia, 2.5-3.5% available phosphoric acid, and 1-3% total phosphoric acid.

Milbit blue. Any of a number of the varieties of iron blue pigments. See Iron blues.

Milton.[®] Trademark for metabisulfite (i.v.).

nylon resins said to differ from conventional polyesters in the following ways: (1) Highly water-resistant (dimensionally stable); (2) ductile, as opposed to the opacity of existing types; (3) adhesion to metals, glass, and other smooth surfaces; (4) tensile strength (up to 7500 psi) and elongation (up to 600%) of high strength and internal plasticization.

mineral. A loose and incorrect term that may be defined chemically as any element, inorganic compound or mixture occurring or originating in the earth's crust or atmosphere, including all metals and nonmetals (except carbon), their compounds and oxides. Inorganic gases (H₂, O₂, N₂, CO₂) are regarded as minerals. The term has long been used by biologists to indicate the "kingdom" of nature. Carbon-rich substances and mixtures, such as coal, petroleum, asphalt and tour-vegetable waxes, often loosely called minerals, are organic materials that are not original components of the earth's crust and thus are not true minerals. The term was illegitimately used by early chemists to describe a variety of substances, many of these uses are obsoleten, but a few persist, e.g., mineral acids; any of the major aromatic acids (taffuric, anisic, hydrocinnic).

mineral black. Inorganic black pigments.

mineral blue. Varieties of blue pigments.

mineral green. Industrial dyes; mineral dust.

mineral oil: liquid petroleum derivative.

mineral pitch: asphalt.

mineral red: mineral red oxide red.

mineral rubber: Brown asphalt.

mineral spirits: Grade of asphalta.

minera water: natural spring water containing sulfur, iron, etc.

mineral wax: wax found in the earth (asbestos), or derived from petroleum.

mineral wool: fibers made by blowing air or steam through slag.

As used by nutritionists the term refers to such components of foods as iron, copper, phosphorus, calcium, iodine, selenium, fluorine and trace micro-nutrients.

minimum, **min.** A unit of volume equal to about 0.06 ml; used chiefly in pharmacy.

minium PbO. Natural red oxide of lead. Found in Colorado, Idaho, Utah, Wisconsin. See also Lead oxide, red.

minoxidil (Rogaine). For series of steam-distilled pine oil used in disinfectants; cleaning compounds; insecticides; paint and varnish; textile processing.

"Min-i-Gel"[®] Trademark for colloidal atenolol clay. Available in various grades. Forms stable gel solutions in presence of electrolytes, such as saturated salt solutions.

*Min-U-Sil.[®] Trademark for high-purity, crystalline silica, in uniform micron sizes, 5, 10, 15 and 30.

Uses: In epoxy resin formulations, silicone rubbers, solid polyurethane and other elastomers; industrial and latex paints; certain medical applications; high-pressure insulation products.

*Mikton-Sulfam.[®] Trademark for sodium diprotomethane (i.v.), a water-soluble x-ray contrast medium.

MIP. Abbreviation for monosopropylamine. See isopropylamine.

miraflo. See N,N'-dilisopropylidenediphosphoryl fluoride.

*Miralox.[®] Trademark for a series of allyl type resins. Epoxy resin esters are also marketed under this name. Available in all modifications including drying oils, semi-drying oils, non-drying oils, naphthalic and phenolic resins.

mirbane oil. See nitrobenzene.

mirfat. Generic name for fudaciacin/roaccidhydro-Cu-12.

Properties: White odorless crystals, soluble in benzene and dioxane; insoluble in water; decomps at 45°C.

Hazard: Toxic by ingestion; moderate skin irritant.

Uses: Systemic insecticide; effective against fire ants, but prospective. Use has been restricted. May be carcinogenic.

*Mirax.[®] Trademark for a calendared, translucent PVC film. Available in film or sheeting for a wide range of packaging applications.

mirtoxime molecules. See optical isomerism; enantiomorph, chiral.

misch metal. The primary commercial form of mixed rare-earth metals (95%), prepared by the electrolysis of fused rare earth chloride mixtures. Sp. gr. about 6.67, m.p. about 648°C. Form: Flattened plates weighing 40 to 50 lb packed in oiled paper, impregnated in oil, or coated with vinyl paint.

Hazard: Flammable, dangerous fire risk.

Uses: Lamp filaments; ferrous and non-ferrous alloys; cast iron, aluminum, nickel, manganese and copper; alloys; gel in vacuum tubes; magnetic alloys.

Shipping regulations: (Rail) Flammable solids, 4.2, 5.1. (Air) Flammable Solid, 4.1. (Sea) Flammable Solid, 4.1.

"Misox."[®] Trademark for potassium chloroformate. Used as a carboxylic anhydride.

mixed acid (nitration acid). Acids and nitric acids used for manufacture of explosives, 30% nitric acid and 61% sulfuric acid.

misread: Causes burns; hazard by ingestion and inhalation.

misibility. The ability of a liquid or gel to dissolve uniformly in another liquid or gel. Gases mix with

their chemical basis are completely miscible. Some liquids, however, because of the formation of intermolecular forces, reach partial miscibility with water slightly. Liquids that do not miscible with water often react with it and water tends to liquify, but it may solidify.

misren.[®] Trademark for magnesium silicate available as talc. See also talc.

mitochondria. Particles of cytoplasmic membranes which are the seat of cellular respiration. They contain the adenine triphosphate which is the source of living energy, nucleic acids, vitamins, and other substances, all those involved in conversion into a form usable by the mitochondria, and DNA. It was found there, yeast is a paramecium. For research purposes: Mitochondria C, C₂H₅NO₂.

mitotic. Antibiotic derived from Streptomyces, effective against tumors.

The division of a cell into two new cells having the same constitution as the parent.

mitotic index. Component of mitosis in a tissue. See also cell (1).

mitotic spindle. The division of the nucleus into two new nuclei. Each has the same identical nucleic acids as the parent.

mitotic stain. Stain for highlighting the chromosomes in a cell.

mitral valve. See heart valves.

mitral valve prosthesis. An artificial heart valve.

mitral valve replacement. Replacement of the mitral valve by a mechanical or biological valve.

mitral valve stenosis. A narrowing of the mitral valve opening.

mitral valve thrombosis. Clotting of the blood in the mitral valve.

mitral valve prolapse. A condition in which the mitral valve does not close tightly.

mitral valve repair. A procedure to correct mitral valve prolapse.

mitral valve replacement. Replacement of the mitral valve by a mechanical or biological valve.

mitral valve stenosis. A narrowing of the mitral valve opening.

mitral valve thrombosis. Clotting of the blood in the mitral valve.

mitral valve prolapse. A condition in which the mitral valve does not close tightly.

mitigation. The ability of another liquid or gel to dissolve uniformly in another liquid or gel. Gases mix with